# $CO_2$-Based Polypropylene Carbonates with High-Stretch and Self-Healing Properties

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## Supporting Information

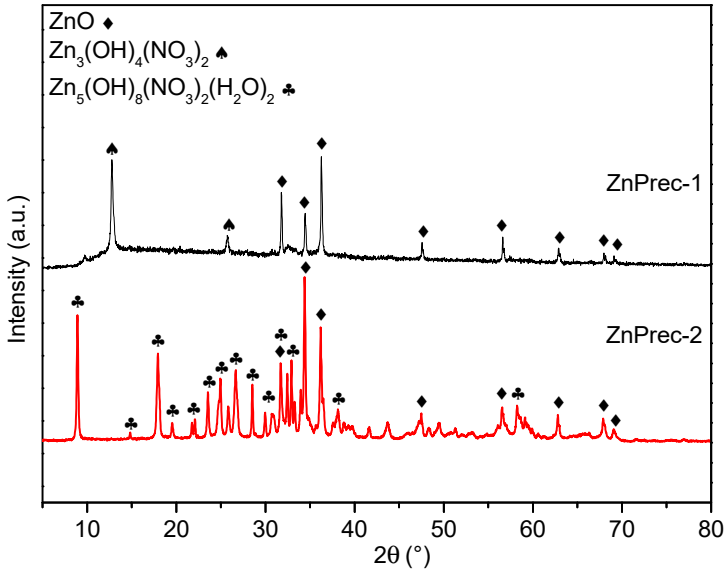



**Figure S1:** XRD patterns of the zinc precursors used to prepare the zinc glutarate catalysts ZnGl-1 and ZnGl-2.

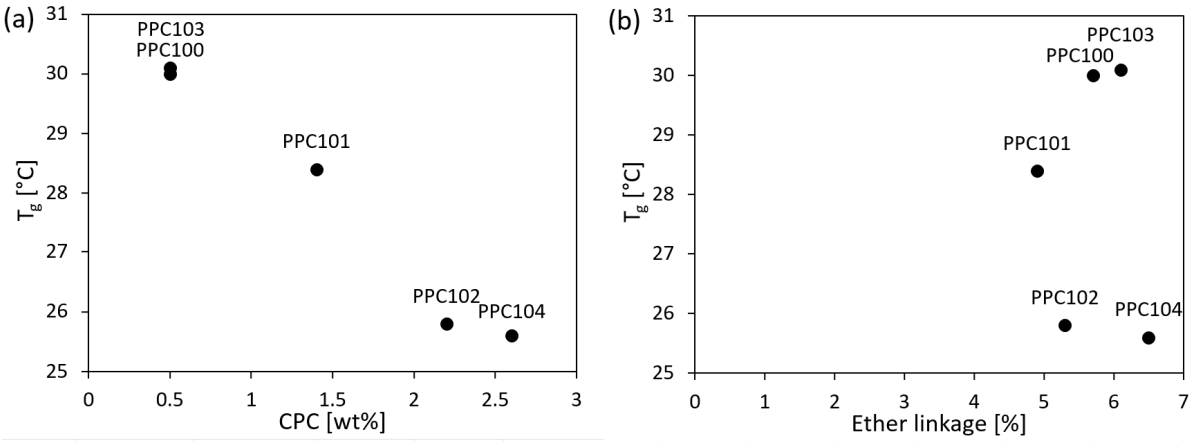



**Figure S2:** Glass transition temperature ($T_g$) of the polypropylene carbonate (PPC) materials as a function of the cyclic propylene carbonate (CPC) content (a) and of the percentage of ether linkages (b).

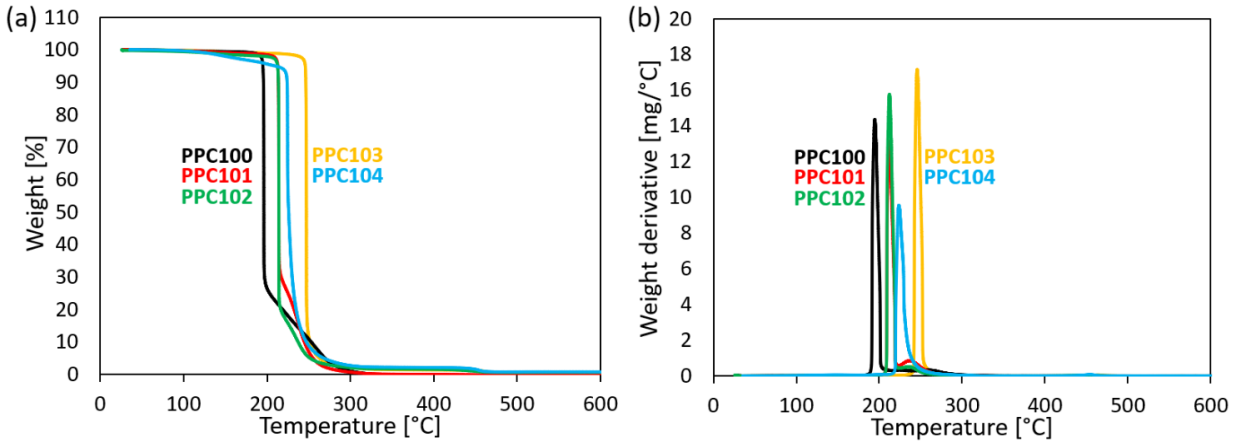



**Figure S3:** TGA traces of the PPCs: (a) weight and (b) weight derivative as a function of temperature.

**Table S1:** Comparison between the flow times obtained in creep tests for $T_0$ = 20 °C or 50 °C and the times required for effective self-healing according to single-lap shear tests and T-peel tests after joining at $T_{room}$ or 50 °C, and in either absence or presence of an external pressure (w/o p; with p).

| **Temperature** | **20 °C / $T_{room}$** | | | **50 °C** | | | | |
|---|---|---|---|---|---|---|---|---|
| **Time for** | **Flow** | **Self-healing** | | **Flow** | **Self-healing** | | | |
| **Test** | **Creep** | **Single-lap (with p)** | **T-peel (with p)** | **Creep** | **Single-lap (w/o p)** | **T-peel (w/o p)** | **Single-lap (with p)** | **T-peel (with p)** |
| **PPC100** | 60 d | 1 to 7 d | > 7 d | 0.13 min | < 10 min | 10 min to 2 h | < 10 min | < 10 min |
| **PPC101** | 600 d | > 7 d | > 7 d | 6.0 min | < 10 min | 2 h to 1 d | < 10 min | 10 min to 2 h |
| **PPC102** | 7 d | 1 to 7 d | > 7 d | 0.26 min | < 10 min | 2 h to 1 d | < 10 min | 10 min to 2 h |
| **PPC103** | $10^4$ d | > 7 d | > 7 d | 20 min | < 10 min | > 1 d | 10 min to 2 h | 2 h to 1 d |
| **PPC104** | 200 d | > 7 d | > 7 d | 1.1 min | < 10 min | 2 h to 1 d | < 10 min | 2 h to 1 d |